

## Foodborne Illnesses and Deaths in Connecticut, 1996-1999

The Centers for Disease Control and Prevention's (CDC) Emerging Infections Program, Foodborne Diseases Active Surveillance Network (FoodNet) collects data on nine foodborne diseases in nine states in the United States (US) to quantify and monitor foodborne illness. Connecticut has been a member of FoodNet since its inception in 1996. Initially only New Haven and Hartford counties participated. In 1997, Fairfield County was added; since 1998 surveillance has been statewide.

In Connecticut, from 1996 through 1999, FoodNet identified 4550 illnesses, 883 hospitalizations, and 21 deaths (7 in 1996, 5 in 1997, 6 in 1998, and 3 in 1999) due to specific foodborne pathogens (Table 1). These numbers do not reflect the true numbers of foodborne related illnesses, hospitalizations, and deaths. Only laboratory-confirmed illnesses caused by the nine agents under surveillance were counted, and surveillance was not statewide until 1998. As a result, the number of illnesses, hospitalizations, and deaths reported through a surveillance system as comprehensive as FoodNet represents only a fraction of the true number.

National estimates of foodborne illness and deaths were recently published by the CDC (1). Extrapolating from the proportion of US residents living in Connecticut in 1999 (3,282,031), one can estimate that there are 916,159 illnesses, 3887 hospitalizations, and 63 deaths due to foodborne illness annually in Connecticut (Table 2).

### Editorial:

Diseases that are usually foodborne impose a significant health burden on the US population. To better quantify the impact of foodborne disease in the US, the CDC compiled and analyzed information from multiple surveillance systems and other sources. They estimate that foodborne diseases cause approximately 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths in the

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**Table 1: Reported Illnesses, Hospitalizations, and Deaths for Nine Foodborne Infections, FoodNet, Connecticut, 1996-1999\*.**

	Reported Illnesses	Hospitalizations	Deaths
<i>Campylobacter</i>	1959	239	2
<i>Cryptosporidium</i>	108	28	2
<i>Cyclospora</i>	39	1	0
<i>E. coli</i> O157	224	89	1
<i>Listeria</i>	83	74	13
<i>Salmonella</i>	1720	375	3
<i>Shigella</i>	331	43	0
<i>Vibrio</i>	16	10	0
<i>Yersinia</i>	70	24	0
<b>Total</b>	<b>4550</b>	<b>883</b>	<b>21</b>

\*In 1996, only Hartford and New Haven counties were counted; in 1997, Fairfield county was added; since 1998, all counties have been counted.

**Table 2: Estimated Annual Numbers of Foodborne Illnesses, Hospitalizations, and Deaths, Connecticut.**

	Illnesses	Hospitalizations	Deaths
Known food-borne agents	169,944	722	22
Unknown food-borne agents	746,215	3165	41
<b>Total</b>	<b>916,159</b>	<b>3887</b>	<b>63</b>

US each year. Known pathogens account for an estimated 14 million illnesses, 60,000 hospitalizations, and 1,800 deaths. Three pathogens, *Salmonella*, *Listeria*, and *Toxoplasma*, are responsible for 1,500 deaths each year, more than 75% of those caused by known pathogens. Unknown agents account for the remaining 62 million illnesses, 165,000 hospitalizations, and 3,200 deaths (1).

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## ***Escherichia coli* O157 Infections in Connecticut, 1990 - 2000**

*Escherichia coli* O157:H7 was first described as a human pathogen in 1982 (1). It has since been identified as an emerging cause of acute infectious diarrhea and the leading cause of hemolytic uremic syndrome (HUS)(2).

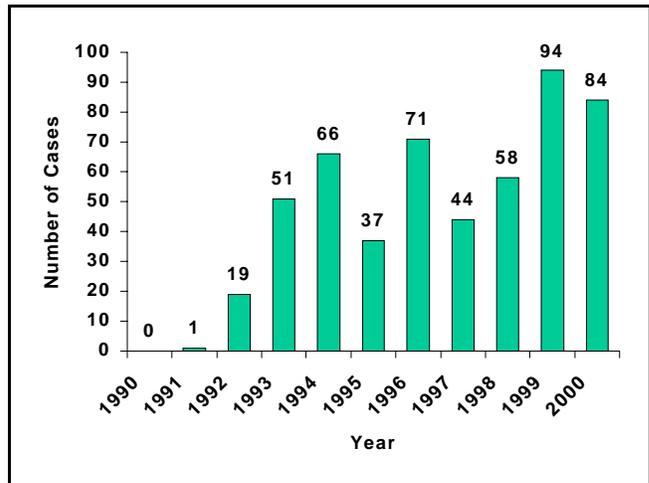
In Connecticut, *E. coli* O157 infections have been reportable since January 1, 1990. No cases were reported in 1990. From 1991 through 2000, 525 cases were reported (Figure 1).

The average annual rate of *E. coli* O157 infection was 1.6 cases per 100,000 population. Rates were highest in Tolland County (2.5) and lowest in Hartford County (1.1) (Figure 2). Children ≤ 9 years of age had the highest rate while the lowest rate occurred among persons 30 – 39 years of age (Figure 3). Fifty-six percent of cases were female. Infection was seasonal with 257 (49%) cases reported in the summer months of June, July, and August.

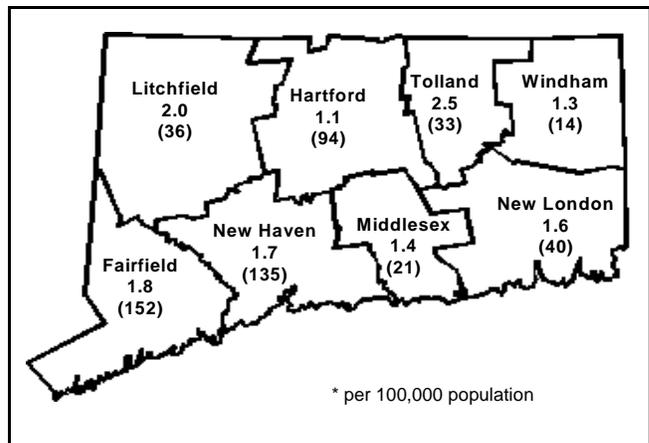
Information on HUS, hospitalization, and death has been obtained on all reported *E. coli* O157 cases since January 1, 1998. Of the 236 cases reported in 1998 - 2000, 106 (45%) were hospitalized, 15 (6%) had HUS, and 4 (2%) died (1 death in 1999 and 3 deaths in 2000).

Since 1990, eight outbreaks involving 115 persons were investigated by the Department of Public Health (Table 1).

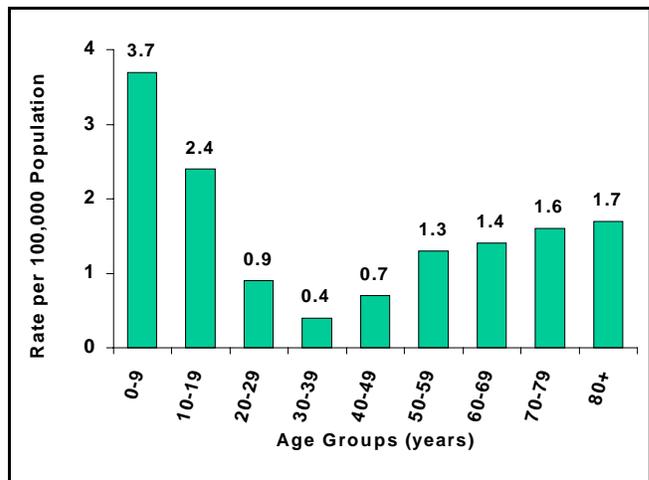
**Figure 1: *E. coli* O157 Infections by Year, Connecticut, 1990 - 2000**



**Figure 2: Average Annual Rate\* (Cases) of *E. coli* O157 Infections by County, Connecticut 1990 - 2000**



**Figure 3: Average Annual Rate of *E. coli* O157 Infections by Age Group, Connecticut, 1990 - 2000**



**Table 1: *E. coli* O157 Outbreaks, Connecticut\*, 1990 – 2000.**

Year	# Ill	Location of Exposure	Known/Suspected Source or Vehicle
1993	23	Fairfield County	Hamburger
1994	19	Fairfield County	Retail Supermarkets
1996	21	5 counties	Mesclun lettuce
1996	12	3 counties	Unpasteurized apple cider
1998	10	4 counties	Hamburger
1999	5	Multi-state	Unknown
1999	17	Multi-state	Unknown
1999	8	Tolland County	Person-to-person transmission

\* Connecticut residents only.

### Editorial

An estimated 73,500 illnesses, 2000 hospitalizations and 60 deaths occur in the US each year as the result of *E. coli* O157 infection (3). In Connecticut, the number of reported *E. coli* O157 infections increased from 0 in 1990 to 84 cases in 2000. At least some of this increase is a result of laboratories expanding criteria for routine testing of stool specimens for *E. coli* O157 (4).

Most patients have reported bloody diarrhea and abdominal cramps. Complications are more common in the very young and in the elderly and include hemolytic uremic syndrome and thrombotic thrombocytopenic purpura.

Most cases of *E. coli* O157 are sporadic and consumption of undercooked ground beef has been found to be a common cause of these infections. In addition, outbreaks attributed to *E. coli* O157 occur each year in the US. Investigation of outbreaks can be an opportunity to explore the epidemiology of foodborne diseases and develop interventions. For example, in 1996, two separate outbreaks of *E. coli* O157 infections occurred among Connecticut residents. Investigations implicated consumption of mesclun mix lettuce and unpasteurized apple cider. (5,6)

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## Shiga toxin-producing *Escherichia coli* in Connecticut, 2000 – 2001

The most common Shiga toxin-producing *Escherichia coli* (STEC) serotype that causes illness in the United States (US) is *E. coli* O157:H7. However, over 100 different STEC serotypes have been isolated from humans, and studies in other countries suggest that disease caused by non-O157 STEC is at least as prevalent as disease cause by O157. In the US, non-O157 STEC receives attention primarily when it is associated with HUS or outbreaks. To date, three outbreaks of non-O157 STEC have been documented in the US: O104:H21 in 1994 in Montana (1), O111 in 1999 in Texas (2), and O121 in 1999 in Connecticut (3).

The role of non-O157 STEC in human disease and its relative contribution to the burden of enteric illness in the US is largely unknown. Historically, testing for *E. coli* O157 does not detect non-O157 STEC. In 1995, the Food and Drug Administration licensed the first of several rapid enzyme immunoassays capable of detecting Shiga toxins in stool specimens. These commercial kits are being used by an increasing number of clinical laboratories in Connecticut. In 2000, Shiga toxin-related disease was added to the list of Laboratory Reportable Significant Findings in Connecticut. Laboratories are

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required to send Shiga toxin-positive broths to the State Laboratory for confirmation and identification of the causative organism.

From January 1, 2000 through June 30, 2001, a total of 62 Shiga toxin-positive broths were submitted to the State Laboratory. Of those, 50 (81%) were confirmed as Shiga toxin-positive, and *E. coli* was isolated from 47 (94%). Twenty-two (47%) of 47 were identified as O157 compared with 25 (53%) non-O157 serotypes.

Non-O157 serotypes identified included: 5 isolates of O103:H2; 5 isolates of O45:H2; 2 isolates of O111:NM (non-motile); 2 isolates of undetermined O-antigen:NM; 1 isolate each of O8:H14, O26:NM, O91:NM, O103:H11, O103:H25; O111:H8, O145:NM, O163:H19, and O174:H21. Serotype results are pending on two isolates.

In addition to laboratory-based surveillance for STEC, a 2-year epidemiologic study began in February 2000 to determine the spectrum of illness and risk factors for STEC infection in Connecticut. All persons with culture-confirmed STEC infections are enrolled in the study and interviewed using a standardized questionnaire.

**Editorial**

Non-O157 STEC play an important role in diarrheal illness. However, its relative contribution to the burden of enteric disease is less clearly understood. In Connecticut, STEC is laboratory reportable and seven clinical laboratories use rapid enzyme immunoassays for detecting Shiga toxin in stool specimens. In Connecticut, Shiga toxin testing for *E. coli* is increasing. Based on 18 months of Shiga toxin testing results, non-O157 STEC was detected more often than O157 (53% vs. 47%).

Health care providers evaluating patients with diarrhea (especially bloody diarrhea) or HUS should consider infection with non-O157 STEC and have specimens from patients tested for Shiga toxin.

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